PERSPECTIVE

The Emerging Role of Online Communication Between Patients and Their Providers

Steven J. Katz, MD, MPH, Cheryl A. Moyer, MPH

Despite the explosion of online communication in the community, its use between patients and their health care providers remains low. However, rapidly growing patient and provider interest in using online communication has motivated organizations to consider options for deploying these new tools in clinical practice. In this paper, we describe the barriers and challenges health care providers and their organizations must address in developing and deploying these new tools. We formulate lessons from early experiences with e-mail and web-based communication in clinical settings. Finally, we provide a roadmap for developing and deploying these new tools in clinical practice. Health care providers and their organizations will need to consider issues related to technology, data management, operations, communication management, and financial support in order to successfully deploy online services and communication for patients in clinical settings.

KEY WORDS: **online communication; medical costs; quality.**
J GEN INTERN MED 2004;19:978–983.

Over the past decade, the explosion of online communication in the community has motivated patients to explore opportunities to use these modes of communication with their health care providers. Many patients see these new communication tools as much more efficient than the traditional modes of communication—the face-to-face visit and the telephone. It is not surprising that many patients eagerly seek out better ways of interacting with their providers. Navigating schedule systems, parking lots, waiting rooms, nursing stations, and checkout counters to spend an average of 10 minutes with a physician[1] is no small price to pay for issues that, in many instances, could be better addressed through other, less burdensome modes of communication. Despite advances in phone system technology, automated message systems frustrate many patients. Largely due to the frustration with communicating with physicians, patients remain dissatisfied with access to their health care providers.[2–6] For many patients, using online communication appears a better option than more traditional modes.[7–10]

Online communication is also appealing to physicians and staff. Physicians and staff navigate an increasingly fragmented communication environment that forces them to communicate through several disparate modes: face-to-face encounters, phone messaging, e-mail, digital beepers, and of course, the paper chase. This fragmentation can result in delays or omissions of important information, yielding lower provider satisfaction and quality of care.[11] Additionally, communication modes and tasks are often poorly matched. For example, rather than requiring a face-to-face visit, issues such as referral questions, reporting of test results, or follow-up to routine health matters can be more efficiently managed by phone or by asynchronous modes such as e-mail or a web tool. As such, providers are increasingly looking to e-mail and the web to improve the efficiency of communication in clinical practice.[6,12–14]

Nonetheless, online communication has diffused very slowly in clinical practice.[11,15] In this paper, we describe the barriers and challenges providers and their organizations must address in developing and deploying these new tools. We formulate lessons from early experiences with e-mail and web-based communication in clinical settings. Finally, we provide a roadmap for developing and deploying these new tools in clinical practice.

Barriers and Challenges

A number of barriers explain the slow diffusion of online communication in clinical practice (see Table 1). Health care financing and organization evolved based on traditional methods of communication.[15] Reimbursement policies remain largely based on the volume, duration, and complexity of face-to-face visits. Despite years of debate, phone consultations are generally not directly reimbursed. Similarly, with the exception of a few demonstration projects,[16–20] most payers are not adopting policies that directly pay for online patient-physician encounters.[11,15] Organizations are therefore hesitant to invest in new online communication

Received from the Division of General Medicine (SJK), Department of Internal Medicine, University of Michigan; Veterans Affairs Ann Arbor Healthcare System (SJK); Department of Health Management and Policy (SJK), School of Public Health, University of Michigan; and Global REACH (Research, Education, and Collaboration in Health) (CAM), University of Michigan, Ann Arbor, Mich.

Address correspondence and requests for reprints to Dr. Katz: Departments of Medicine and Health Management and Policy, University of Michigan, 300 N. Ingalls, Suite 7E12, Box 0429, Ann Arbor, MI 48109-0429 (e-mail: skatz@umich.edu).

Table 1. Barriers to Online Communication Between Patients and Their Providers

Perspective	Barriers
Organizations	No direct payer reimbursement for online communication Technical and operational complexity Uncertainty about privacy, confidentiality, medicolegal issues
Providers	Concerns about being overwhelmed with messaging Concerns about relevance and appropriateness of messages
Patients	Little experience with online clinical communication tools Facility and use of online communication varies: those most "in need" may be least likely to be online

tools. Additional organizational challenges include technical and operational issues. Building a web-based patient portal and integrating it into day-to-day patient care activities is a complex endeavor. It requires a multipronged strategy that addresses technical and operational issues constrained by local factors. One size does not fit all, and there are currently no roadmaps that guide organizations to successful implementation. This is particularly challenging for smaller group practices with limited information technology support. Finally, those considering using online communication are concerned about patient privacy, confidentiality, and associated medicolegal issues.[8–10]

Another set of challenges is related to clinicians and staff who have concerns about managing online communication. Providers are concerned that e-mail and web would add to their workload rather than substitute for other tasks, and that many messages might not be clinically relevant.[8,9,21] In addition, there is currently little consensus about the rules of patient-provider online interactions and the important role that can be played by staff in responding to certain types of messages.[22] A final set of challenges is patient related. In general, patients are unaccustomed to online communication in clinic settings. Another important challenge is the growing digital gap in the community. About 70% of U.S. adults regularly use the Internet and e-mail, but there are large disparities by age, education, health, and ethnicity with regard to facility and daily use of e-mail and web-based services.[8,23,24] Thus, the most vulnerable patient populations may have the least experience with these new tools.

Why E-mail Is Not the Answer

E-mail presents an attractive alternative to more traditional modes of communication for several reasons. It is now used in virtually all employment settings and many patients use it on a daily basis. Furthermore, e-mail systems are now highly compatible across platforms, resulting in seamless communication between operating systems. Its enormous reach and asynchronous nature are especially attractive to patients and providers whose busy schedules make it difficult to connect over the phone. However, a number of significant problems with e-mail limit its use in clinical settings. First, e-mail presents several security-related challenges. The author of an incoming e-mail cannot be easily verified. Furthermore, because e-mail is generally not encrypted, messages accidentally or intentionally forwarded, copied, or intercepted can be read by third parties, and is thus not in compliance with current Health Insurance Portability and Accountability Act of 1996 regulations.[25] Second, e-mail is an unstructured, free-text medium, which may yield ambiguous or incomplete messages from patients. While patients may see this unstructured environment as an asset of e-mail, providers faced with responding to an incomplete message are likely to disagree. Third, there is no uniform way of tracking incoming and outgoing e-mail messages and whether a sent message is ever opened. Finally, it is difficult to efficiently integrate e-mail into clinic operations because messages cannot be automatically routed to the appropriate staff person and exchanges cannot be efficiently documented in the medical record.

Because of the fundamental limitations of e-mail in health care settings, organizations are increasingly turning to web-based communication tools and solutions. Web-based tools have many of the advantages of e-mail—including its wide reach, asynchronous nature, and relative ease of use—yet do not suffer from e-mail's drawbacks. In contrast to e-mail, web-based tools have the potential to exchange and store information in a structured, easily retrievable manner; the services offered can be as simple or as robust as the clinical context requires; and communication can be easily tracked, managed, documented, and evaluated. These features are particularly important in order to realize the cost savings of greater efficiency of online communication in clinical practice. Finally, web-based tools are more secure than regular e-mail because authentication procedures can be deployed and exchanges cannot be forwarded.[26] However, these advantages come at a price. Organizations will need to invest in technology, data management, operations, and communication management to reap the full benefits of online communication. Furthermore, patients will be challenged as they learn how to navigate more complex web interfaces compared to regular e-mail in order to connect to their providers. In the sections below, we describe the challenges that confront providers and organizations as they consider investing in these new communication tools.

Lessons from the Frontline

Lessons from demonstration projects should be formulated with caution, because advances in web-based

Table 2. Challenges and Solutions to Deployment of Online Communication

Challenges	Solutions
Facility and comfort with web-based communication will vary across patient groups	Tailor web design to diversity of patient needs: new users need a detailed road map and intuitive navigation; established users need web navigation short cuts
Clinical context of communication will vary across patient groups	
Early adopters	Adjust organizational expectations regarding initial offset of clinic resources
Younger, healthier than average	
Low utilizers of traditional resources	Prepare staff for changes in clients and messaging content over time
Short communication threads address more acute, episodic issues	
Later adopters	Develop strategies for targeted marketing to engage "later adopters" earlier in the process
Older, more chronic conditions	
Higher resource utilizers	
Longer communication threads address chronic issues	
Scope of issues and duration of patient relationships will vary across clinical specialties	Assess patient and provider communication needs across the continuum of care
Patients view needs across the continuum of problems while clinicians view patient needs from their narrower clinical perspective	Bridge differences in perspectives about patient communication across specialties

technology and online use in the community continue to evolve.[27] Additionally, innovations in online technology and clinical data systems have created new opportunities that were largely unavailable to prior initiatives.

Design for Efficiency

Patient, provider, and organizational factors are critical to creating an efficient web-based communication process (see Table 2). Patients will come to the website with different levels of facility and comfort with web-based technology. Web design will need to accommodate new users who will require a detailed and intuitive interface, while simultaneously accommodating established users who will need communication shortcuts to avoid frustration. Another dimension that will vary across patients over time is clinical communication context. Early adopters of web-based communication in clinical settings will likely be younger, more highly educated, and healthier than the general clinic population.[9,10] These patients will have different communication needs than the more typical primary care patients, who will tend to be older, less educated, and more burdened by chronic disease. Early adopters may have less demanding communication needs because they may be lower utilizers of phone and visit resources and require relatively short "threads" of patient-provider interactions to complete requests. By contrast, later adopters may have more demanding communication needs requiring greater administrative support for web use and clinician inputs to address more challenging health issues.

From the provider perspective, the clinical communication context will differ across specialty settings in terms of the scope of issues and the duration of relationships between patients and providers. For example, patients in obstetrics communicate about a relatively narrow set of issues and services related to pregnancy, delivery, and postpartum care. Relationships between patients and providers will generally be limited in time and scope. Patients seen in cardiology or oncology will have broader communication needs and longer relationships, while patients in primary care may have the broadest scope of communication and longest ongoing relationships. From an organizational perspective, a web-based communication tool will need to integrate these different settings of care across the continuum of care because many patients will need to communicate across clinic specialty settings and providers.

Design for the Organization

The technical and operational challenges of building and integrating web communication in clinical practice motivate the need for a clear vision of how these new communication tools will meet larger organizational goals. Medical care organizations improve health outcomes by effectively and efficiently delivering medical service. A patient portal meets these goals in several ways. First, it addresses "unmet need" for patient communication, which can improve patient satisfaction and the effectiveness of service delivery (for example, through improved management of medical problems). Second, it can improve the efficiency of service delivery by substituting more efficient communication for less efficient communication.[11] Finally, it can improve business practices through more efficient patient registration and billing. Three components of a patient portal that address these organizational goals are described below: 1) service-related features such as medication requests and renewals, referral requests, scheduling, and billing; 2) a provider communication tool; and 3) a patient portal health record. The components can be viewed as modules because each could be deployed separately and evolve over time in a phased rollout. Table 3 summarizes strategic considerations of each of these components addressed below.

Table 3. Components and Considerations of a Patient Portal

Components	Considerations
Service-related features Medication renewals Scheduling Referral requests Billing	Deploy system wide Assess consequences on organizational resource use Understand implications for organizational goals
Patient-provider communication tool	Deploy a phased rollout in selected provider settings Tailor to provider needs by identifying work groups and mapping workflow Automate documentation Develop guidelines for appropriate content of messaging and expectations about replies
Patient portal record Medical record source Test results and reports Provider notes and summaries Patient source Current medications Immunization history Blood sugar or blood pressure logs	 Identify appropriate content Develop rules for access and processing of various components of the medical record based on clinician preferences
General	Develop and deploy online and phone user support strategy Develop and deploy an evaluation, feedback, and improvement strategy

Service-related features can be prioritized based on patient needs, resource implications, and organizational goals. One advantage of these features is that they can be deployed system wide because these communication processes can be largely standardized across clinic and specialty settings. Different features will have different consequences for organizational resources and different implications for organizational goals. Online medication renewals, referral requests, and basic scheduling requests (e.g., canceling or requesting a visit) demand moderate resource commitments from operations and can easily substitute for less efficient processes. However, other features such as bill payment or automated scheduling would require greater resource commitment to web design, data management, and operations.

The second component of a patient portal, a patient-provider communication tool, must compete with other modes of communication that have been entrenched for many years. Patient-provider communication still remains largely based on visits and phone. Between-provider communication relies on similar modes of communication but with increasing reliance on e-mail and digital beeper communication. To be successful, a communication strategy must address provider perspectives. This should include identifying workgroups, mapping workflow, and facilitating communication between clinicians and staff. It should also include a robust method for documenting web-based interactions directly into the medical record. Automated documentation eliminates a time-consuming and inefficient component of workflow that would be welcomed by staff and clinicians. Because the communication tool will need to be tailored to providers' needs and preferences, a phased rollout to selected clinical settings will likely foster the most receptive environment during the initial phases.

A third component of a patient portal is a patient portal medical record. The patient portal record can be populated by information from both providers and patients. Advances in electronic storage of clinical data will facilitate the automated digital transfer of information from a provider-generated clinical and administrative data repository to the patient portal record. This may include patient schedules, test results, and physician notes, as well as registration and billing information. Additionally, patients may send relevant information to the record pertaining to their prior medical information (e.g., immunization history), current health issues (e.g., current medications, blood sugar or blood pressure logs), or relevant contact data (e.g., pharmacy and updated registration information). A patient portal record strategy should consider the content of the record and rules governing access and processing of different components of the medical record from provider, patient, and organizational perspectives. Because patient and staff access may need to be tailored to provider preferences, a phased rollout of this feature of the patient portal will likely yield the least resistance and provide important feedback to inform a system-wide deployment.

The issues addressed above can inform the roadmap for development, deployment, and evaluation of a patient portal. The roadmap will be influenced by a number of local factors such as the current state of information technology support and infrastructure (e.g., electronic medical record or automated scheduling or billing systems); level of interest among different opinion leaders, physicians, and staff; and level of integration of operations. Smaller group practices with limited resources for information technology support will largely rely on software solutions that encrypt regular e-mail or a web-based communication tool managed by an external vendor (application service provider). These tools will provide secure messaging between providers and patients. Larger practices with substantial investments in information technology will have the opportunity to build the full set of portal features by connecting the portal to clinical and administrative data systems.

One key ingredient to the initial success of a patient portal is managing patient-provider communication flow. Evidence suggests that the initial volume and growth of web-based communication in clinical practice will be modest.[9,10] This gradual growth curve will give organizations the time to learn from initial deployment and manage communication to minimize disruptions in operations. A communication management strategy should include clinician and staff training, emphasizing support in real time at the point when providers need it. This could be accomplished through web-based training and ongoing phone support. Because web-based communication rollout will require substantial staff and clinician effort, organizations should allocate sufficient provider time to this initiative, especially during its initial phases.

A communication management strategy should also include patient education and expectation management that addresses guidelines for appropriate communication content and expectations about how the system will respond.[28] This should include guidance about the content of messaging (e.g., include key information, avoid sensitive, complex, or urgent issues, limit requests to one per message), the communication process (e.g., which providers—physicians, nurses, or other clinical staff—will respond, expected response times, limits on the number of interactions within a thread), and additional rules of engagement (e.g., rules for managing the patient portal health record). Some professional groups have published guidelines for the use of online communication in clinical settings.[22,29]

Financial Support for Online Communication

Providers will be challenged to develop a business model to deploy and sustain online communication. Investment in web-based communication is nontrivial, as it requires web design; data connectivity and integration; substantial changes in operations; and a robust and ongoing patient, staff, and physician education and support program. Many providers hope that this substantial investment will pay off quickly by reducing phone calls and inappropriate visits and by dramatically increasing the efficiency of workflow.[19] However, several threats to efficiency may limit cost savings—at least during the initial phases of deployment. First, previously unmet needs may increase total communication burden. Second, insufficient integration (e.g., no robust solution to automated documentation) may limit efforts to streamline workflow. Third, persistent mismatch between communication task and mode may limit reductions in communication redundancy. Finally, patient selection factors may limit resource offsets. Reports from early demonstration projects have conflicted with regard to resource offsets related to online communication.[9,20]

Providers should partner with payers, employers, and patients to develop a reimbursement model to pay for deployment and ongoing support of online communication.[15] However, current reimbursement models and clinician productivity measures thwart robust deployment of online communication because they rely largely on face-to-face visits as the metric. One reimbursement model being deployed by a few provider groups is payments from payers and patients (through a yearly subscription fee or by the encounter) for web-based physician consultations, while other features of the portal are made available at no additional charge.[15,30–32] While payers and employers have resisted direct payments for telephone consultations, online communication may be more attractive because of several advantages over telephone communication. These include the potential for more robust features and opportunities for patients, automated documentation and tracking of different types of interactions, and more efficient integration into provider workflow and clinical data systems. These advantages hold the promise of cost-effective improvements in processes and outcomes of care, which may attract payers and employers to the reimbursement table.

The Need for Evaluation

Rapid changes in community and clinical settings are motivating health care providers and their organizations to develop new ways to communicate with patients. Although online patient-provider communication has diffused slowly, it is likely to accelerate in the next few years. Because innovations in communication technology and clinical data systems are evolving rapidly, there is enormous opportunity—but at the same time—substantial uncertainty about the consequences of these new tools for patient care and provider experiences. Therefore, there will be ongoing demand from providers and payers for evaluation of different approaches to online patient-provider communication in clinical settings. Consequences of online communication for resource use remain uncertain. Evaluation efforts here should incorporate robust measures of workflow to document the saving achieved by online communication. There will also be need to evaluate patient and provider perspectives as new tools are deployed. Additional research questions include the impact of online communication tools on the quality of clinical processes of care. Outcomes might include increased adherence to health maintenance strategies, follow-up of abnormal test results, compliance with medications, or management of chronic conditions. This would require targeting of the appropriate clinical population and tracer conditions. While randomization of online communication interventions is ideal, this may not be feasible in many settings. Observational study designs with appropriate control groups can also yield important information that helps providers understand the implications of these new technologies on patient care. Research results can inform cost-effective approaches to the use of online communication in clinical settings to improve processes and outcomes of care.

We thank Joel Howell, MD, PhD, and Sanjay Saint, MD, for helpful comments on earlier versions of the manuscript.

REFERENCES

1. Stange KC, Zysanski SJ, Jaen CR, et al. Illuminating the "black box." A description of 4,454 patient visits to 138 family physicians. J Fam Pract. 1998;46:377–89.
2. Lin CT, Albertson GA, Schilling LM, et al. Is patients' perception of time spent with the physician a determinant of ambulatory patient satisfaction? Arch Intern Med. 2001;161:1437–42.
3. Bower P, Roland M, Campbell J, Mean N. Setting standards based on patients' views on access and continuity: secondary analysis of data from the general practice assessment survey. BMJ. 2003;326:258.
4. Stevenson K, Ion V, Merry M, Sinfield P. Primary care. More than words. Health Serv J. 2003;113:26–8.
5. Safran DG. Defining the future of primary care: what can we learn from patients? Ann Intern Med. 2003;138:248–55.
6. Jeffords R, Scheidt M, Thibadoux GM. Physician-patient electronic communications. Med Group Manage J. 1999;(suppl):46–9.
7. Kleiner KD, Akers R, Burke BL, Werner EJ. Parent and physician attitudes regarding electronic communication in pediatric practices. Pediatrics. 2002;109:740–4.
8. Moyer CA, Stern DT, Dobias KS, Cox DT, Katz SJ. Bridging the electronic divide: patient and provider perspectives on e-mail communication in primary care. Am J Manag Care. 2002;8:427–33.
9. Katz SJ, Nissan N, Moyer CA. Effect of web-based communicating system on clinic resource use and patient and physician satisfaction in primary care: a randomized controlled trial. Society of General Internal Medicine Annual Meeting. 2003. J Gen Intern Med. 2003;18(suppl 1):207. Abstract.
10. Katz SJ, Moyer CA, Stern DT, Cox DT. Effect of a triage-based e-mail system on clinic resource use and patient and physician satisfaction in primary care: a randomized controlled trial. J Gen Intern Med. 2003;18:736–44.
11. Committee on Quality of Health Care in America IoM. Crossing the Quality Chasm: A New Health System for the 21st Century. Washington DC: The National Academy of Sciences; 2000. Available at: http://www.nap.edu/openbook/0309072808/html/. Accessed June 3, 2003.
12. van der Kam WJ, Meyboom de Jong B, Tromp TF, Moorman PW, van der Lei J. Effects of electronic communication between the GP and the pharmacist, the quality of medication data on admission and after discharge. Fam Pract. 2001;18:605–9.
13. van der Kam WJ, Moorman PW, Koppejan-Mulder MJ. Effects of electronic communication in general practice. Int J Med Inf. 2000;60:59–70.
14. Mandl K, Kohane IS, Brandt AM. Electronic patient-physician communication: problems and promise. Ann Intern Med. 1998;129:495–500.
15. American College of Physicians. The Changing Face of Ambulatory Medicine—Reimbursing Physicians for Computer-based Care: ACP Analysis and Recommendations to Assure Fair Reimbursement for Physician Care Rendered Online. American College of Physicians 2003 Policy Paper. (Available from American College of Physicians, 190 N. Independence Mall West, Philadelphia, Pa 19106.)
16. Maguire P. How one health plan pays physicians for cybercare. ACP Observer. September 2000. Available at: http://www.acponline.org/journals/news/sep00/cybercare.htm. Accessed June 3, 2003.
17. Wynn P. Paying for cybercare? Health plans study the benefits of reimbursing for e-mail consultations. Health Plan Magazine. 42:42–3.
18. McNamara D. Fee-based e-mail consultation tested in California. Internal Medicine News. 2002;35:32–34.
19. Solovy A. E-mail minus "e-mail." A California study shows that online communication can benefit patients, physicians and payers. Hospital & Health Networks. 2002;76:26.
20. Relay Health. The RelayHealth Web Visit Study: Final Report. January 2003. Available at: http://www.relayhealth.com/rh/GENERAL/studyResults/webVisitStudyResults.pdf. Accessed June 3, 2003.
21. Moyer CA, Stern DT, Katz SJ, Fendrick AM. "We got mail": electronic communication between physicians and patients. Am J Manag Care. 1999;5:1513–22.
22. American Medical Association. Guidelines for Physician-Patient Electronic Communications. Available at: http://www.ama-assn.org/ama/pub/category/2386.html. Accessed April 4, 2003.
23. Cole J. Surveying the Digital Future—Year Three: UCLA Center for Communication Policy. Los Angeles, Calif: The UCLA Internet Report; 2003.
24. Madden M. America's Online Pursuits, the Changing Picture of Who's Online and What They Do. Pew Internet and American Life Project; 2003. Available at: http://www.pewinternet.org. Accessed June 11, 2003.
25. Health Insurance Portability and Accountability Act of 1996. Public Law No. 104–191, Section 1173, USC 201.
26. National Research Council. Committee on Maintaining Privacy and Security in Health Care Applications of the National Information Infrastructure. For the Record: Protecting Electronic Health Information. Washington, DC: National Academy Press; 1997.
27. Horrigan JB. Broadband adoption at home: a Pew internet project data memo. May 18, 2003. Available at: http://www.pewinternet.org/reports/toc. Accessed June 11, 2003.
28. White CB, Moyer CA, Stern DT, Katz SJ. A content analysis of e-mail communication between patients and their providers: patients get the message. J Am Med Inform Assoc. 2004;11:260–7.
29. Kane B, Sands DZ. Guidelines for the clinical use of electronic mail with patients. J Am Med Inform Assoc. 5:104–11. Available at: http://jamia.org/cgi/reprint/5/1/104. Accessed June 3, 2003.
30. Maguire P. How one group gives a new meaning to "virtual" access. ACP Observer. April 2003. Available at: http://www.acponline.org/journals/news/apr03/virt_access.htm. Accessed April 8, 2003.
31. Hundley K. Doctors offering "concierge" care. St. Petersburg Times Online. July 28, 2001. Available at: http://www.sptimes.com/News/072801/Business/Doctors_offering__con.shtml. Accessed May 7, 2003.
32. Haeg A. Top-shelf health care—if you have the money. Minnesota Public Radio. June 24, 2002. Available at: http://www.news.minnesota.publicradio.org/features/200206/24_haega_conciergecare/. Accessed May 7, 2003.